

WETLAND BIRDS IN TURKS AND CAICOS ISLANDS I: A SEARCH FOR WEST INDIAN WHISTLING-DUCKS *DENDROCYGNA ARBOREA*

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The West Indian Whistling-duck (Dendrocygna arborea) is globally threatened due to significant population declines during the Twentieth Century. Turks and Caicos is a potentially important range-state for the species, but its status there has never been firmly established. A survey of West Indian Whistling-ducks was conducted in the Turks and Caicos Islands during February and March 1999 to make a preliminary assessment of the distribution and abundance of the species in the territory, and to test the viability of several different survey methods, including aerial surveys, tape-playback of the species' calls, and running transects through different habitat types. Only three-five West Indian Whistling-ducks were recorded at two sites on East Caicos suggesting the species may be genuinely scarce on the islands, overlooked, or seasonally absent. The possibility that West Indian Whistling-ducks behave as somewhat nomadic opportunists in response to unpredictable changes in wetland conditions is raised.

Key Words: Black-billed Whistling-duck, Caribbean wetlands, survey methods, UK Overseas Territories;.

The West Indian Whistling-duck *Dendrocygna arborea* was once widespread in the Caribbean region. Its populations have declined drastically during the last century due mainly to habitat loss and hunting, and it has been designated globally Vulnerable (Collar *et al.* 1994), although no detailed past or present population estimates are available (Collar *et al.* 1992, 1994; Rose & Scott 1997). A large population possibly persists in Cuba, though there are no published population estimates, while Cayman Islands, Bahamas, Jamaica, Dominican Republic, Antigua & Barbuda and Puerto Rico hold smaller numbers (Collar *et al.* 1994).

The Turks and Caicos Islands have generally been considered to be a part of the species' range (e.g. Collar *et al.* 1992) and the territory could potentially be a key range-state because there are very

large areas of undisturbed wetland habitat, and few wetlands have been drained or substantially altered. Human population densities are very low outside the two more developed islands of Providenciales and Grand Turk, and two of the largest islands - West Caicos and East Caicos - are uninhabited (**Figure 1**).

Despite this apparently high habitat availability, there are very few published records of West Indian Whistling-ducks from the territory. A 1930 expedition reported the species on Stubbs Cay, Fort George Cay & Grand Turk (Walsh-McGehee *et al.* 1998). In 1987 there were records from North Caicos of 15 birds on Bellfield Landing Pond and 11 birds on Sawgrass Pond, in July and September respectively (Walsh-McGehee *et al.* 1998). In 1989 a flock of ca. 20 birds, including immatures was seen at Big Pond, North

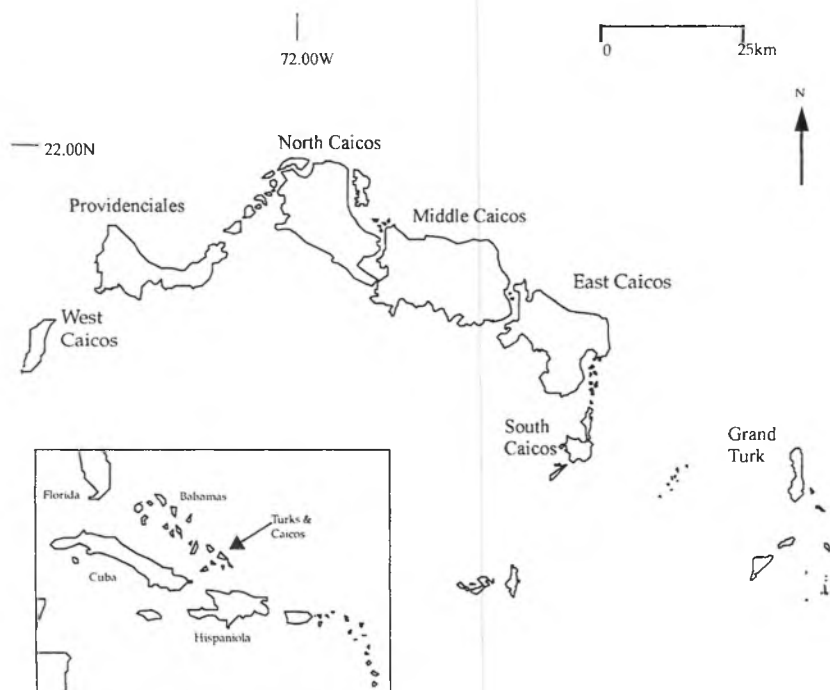


Figure 1. Map of the Turks and Caicos Islands

Caicos, with two at Bellfield Landing Pond, and two near Conch Bar, Middle Caicos (P. Bradley pers. comm.). In 1997 a pair with downy young was seen on a pond on Middle Caicos on 2 December (Walsh-McGehee *et al.* 1998). This is the only known breeding record for the Territory. In October 1998 two birds were seen on Montpellier Pond, Middle Caicos (Pienkowski & Cross unpublished 1999).

There is a need to determine the distribution and abundance of West Indian Whistling-ducks in Turks and Caicos, in order to give a clearer picture of the global status of the species, as well as directing conservation actions and protected area designation within the territory. Such work is particularly relevant at present because plans have been published for a major cruise-liner development on the pristine wetland island of East Caicos (Anon. 1998). This paper reports on a search for West Indian Whistling-ducks in the Turks and Caicos conducted in 1999. There were two aims: firstly to determine the distribution and abundance of the species in the territory, and secondly to evaluate a number of different survey methods.

Habitat use by West Indian Whistling-ducks appears to vary between different parts of the species' range; birds generally feed at night, and roost during the day (del Hoyo *et al.* 1992). In the Bahamas the main feeding areas were fresh or saline lagoons within scrub (Staus 1998a, 1998b). Birds also fed on intertidal flats, on fruits in the crowns of Royal Palms *Roystonea* sp. and in agricultural crops (particularly corn). Roosting sites have been found in mangroves, around lagoons, or in dry scrub (del Hoyo *et al.* 1992; Staus 1998a). Turks and Caicos holds all of these habitat types.

Methods

Fieldwork was conducted between 24 February and 4 April 1999. This coincided with the dry season in the territory, which in this year produced an unusually intense drought such that many lagoons were partially or completely dry. The work was conducted on five islands: Providenciales, West Caicos, North Caicos, Middle Caicos and East Caicos. South Caicos, Grand Turk and the smaller cays were not visited (see **Figure 1**). Five different techniques were used to survey whistling-ducks: look-see counts at lagoons at dawn and dusk, aerial survey, transect counts through salt flats and mangroves, dusk counts on flight lines between mangroves and lagoons, and interviews with local people. Tape playback of the species' distinctive call was used in order to elicit a call response from unseen birds.

Study Sites

North, Middle and East Caicos have rather similar habitat characteristics. The northern (Atlantic) coasts are rocky or sandy beaches with substantial wave action. A band of xerophytic scrub on low limestone ridges runs inland from the Atlantic coast towards the southern (Caribbean) side of the islands. Within the scrub zone are a number of brackish or saline lagoons (known locally as ponds). Most of these are landlocked, though some have narrow sea inlets or subterranean connections to the sea. Mangroves (*Rhizophora mangle*, *Laguncularia racemosa* and *Avicennia germinans*) fringe the lagoons and xerophytic scrub. Mangroves in the territory are typically poorly developed, seldom exceeding 4 m in height. The lagoons are shallow - water depths very rarely exceeded 1 m during this visit - with

Table 1. Numbers of lagoons and survey coverage during West Indian Whistling-duck surveys in Turks and Caicos, February- April 1999.

Island	Number of Lagoons present ¹	Number visited at dawn/dusk ²	Number visited but dry
West Caicos	14	3	0
South Caicos	2	0	0
Middle Caicos	26	8	1
North Caicos	13	9	4
East Caicos	29	11	1
Providenciales	16	10	1
Grand Turk	7	0	0
Larger Cays	13	0	0
TOTAL	120	41	7

¹ Estimated from 1:25,000 maps of the territory² Includes only sites holding water, where a wetland bird census was carried out

little or no emergent or submerged vegetation. Substrates are mostly silt or clay, occasionally of bare limestone. Moving towards the southern side of the islands, the land gets lower, until the scrub is replaced by extensive salt flats, which run to the Caribbean shore. The salt flats have isolated scrub outcrops and large areas of shallow unvegetated water. Fringing the Caribbean shore are further poorly developed patches of mangroves, in general no more than two metres in height. West Caicos and Providenciales contain the same habitat types, but lack extensive salt flats.

Dawn/dusk surveys at lagoons

Forty one lagoons were surveyed at dawn or dusk (a further seven were visited but

were completely dry), representing approximately 33% of the total number of lagoons in the Turks and Caicos (according to 1:25,000 scale maps of the territory) (Table 1). The aim was to locate as many sites as possible where the species was present, and thus to derive a minimum estimate of the size of the population in the territory, as well as determining its distribution. Therefore preferentially selected site were apparently suitable for Whistling-ducks (e.g. larger sites with good habitat, sites with historical or anecdotal records of the species). Of the named ponds with historical records of the species, Bellfield Landing Pond and Sawgrass Pond (North Caicos) were visited but were dry; Big Pond (North Caicos) and Montpeller Pond (Middle Caicos) were surveyed.

On dawn surveys observers arrived at sites ca. 30 minutes before sunrise, at which time it was fully dark. On dusk surveys observers remained at the site until 30-60 minutes after sunset, by which time they would have been unable to see or identify any arriving Whistling-duck unless it had called. One-three observers were present at each site, and distributed themselves around the lagoon such that coverage of the open water and fringing vegetation was maximised. A 60-second tape of West Indian Whistling-duck calls was played at maximum volume through two 10-amp speakers, three-five times per visit.

Aerial survey

An aerial survey of East Caicos was conducted between 0925-1110 hours on 2 March. A top-winged single-engine four-seater 'plane was flown at 90-100 knots and a height of 70 - 100 m. Two flights over all lagoons in the scrub zone were carried out, making a third pass at 50 m if birds remained unidentified. A grid was then flown over the entire area of saltflats and mangroves, passing within ca. 400m. (horizontally) of all points.

Mangrove, saltflat and scrub transects

The Caribbean-coast mangrove habitat was covered by one 8km walked transect, two motorboat transects totalling 4km and one canoe transect of 3km, all conducted during daylight hours. Observers paused and played a 60-second tape of West Indian Whistling-duck once every 250 m. Thus ca. 5% of the Caribbean-coast mangrove habitat of the islands was visited. Twenty kilometres of transects were walked through the saltflat habitat. Locations of transects were dictated by

accessibility. No dedicated transects in xerophytic scrub were conducted. It would have been necessary to cut paths in order to create transect routes. Visibility on either side of a transect route would be very restricted. Given the enormous extent of the scrub habitat, Whistling-ducks would have had to be extraordinarily numerous for there to be any chance of encountering them.

Dusk counts on flight lines

Dusk counts were conducted during four evenings on East Caicos giving a total linear coverage of 4.8km of flight line. Observers were stationed along putative flight lines between mangrove-fringed coastal areas and lagoons, 30 minutes before sunset. Observers stood 400m apart and watched silently for over-flying birds until 30 minutes after sunset.

Interviews with local people

Eight people were interviewed about West Indian Whistling-ducks. Interviewees were asked whether they were aware of the species; where they had seen it and in what numbers; whether they had seen the species recently or in the more distant past; they were asked to describe the birds' habitat and behaviour.

Results

Dawn/dusk lagoon surveys

During the lagoon surveys, West Indian Whistling-ducks were found at two sites, both on East Caicos. One site, Jacksonville Pond (71°34'W, 21°45'N), held two - four birds during a dawn visit. One bird called spontaneously and responded immediately to tape playback of a whistling-duck call.

Jacksonville Pond is saline. It has an unusually extensive, dense and tall mangrove fringe (up to 5m high) and has two small mangrove-covered islands. Again unusually, there are submerged macrophytes. The water is deeper than most lagoons (many of which were entirely less than 0.5m deep), though apparently less than 1m deep in most parts.

At a second (unnamed) site on East Caicos (71°29' W, 21°43' N), a single bird was heard calling briefly 30 minutes after sunset. It did not respond to tape playback, but there was heavy rain and strong winds. The bird was apparently on a large area of dried-out lagoon that had been re-flooded to a depth of ca. 10cm by heavy rain during the previous hour.

Aerial survey

No Whistling-ducks were seen during the aerial survey. It was apparent that only birds that were on open water well clear of fringing vegetation were likely to be seen and identified. Ground-truthing of aerial survey counts indicated that only Greater Flamingos *Phoenicopterus ruber*, heron and egret species, and American Coot *Fulica americana* could be detected and counted from the air.

Mangrove and saltflat transects, dusk counts on flight lines

No West Indian Whistling-ducks were found during transects in mangrove or saltflat habitat, or during dusk counts on flight lines.

Interviews with local people

Middle-aged or elderly respondents were all aware of Whistling-ducks, particularly the habit of feeding in maize crops at night. Several reported seeing substantial numbers, particularly on Middle and East

Caicos (up to the low hundreds), although several stated that they had not seen Whistling-ducks for some time. All reports were from lagoons or of nocturnal feeding in maize crops - though these habitats receive more human visits than other habitats on the territory. It was rather difficult to evaluate the reports. Although people are aware of the Whistling-duck as a distinct type, in practice they rarely differentiate it from other duck species.

Discussion

Occurrence of West Indian Whistling-ducks

West Indian Whistling-ducks were apparently extremely rare on Turks and Caicos during February and March 1999. This may mean that there is no significant population of the species in the territory; however there are two alternative suggestions: Firstly, that the birds were present in much larger numbers, but that they were not found. Secondly that they were scarce at the time of the survey, but occur in greater numbers at other times of the year.

It is unlikely that large numbers of Whistling-ducks were overlooked. Approximately one third of all the lagoons in the territory were visited at either dawn or dusk. Coverage was actually better than this figure implies, because: (1) larger sites with historical records were visited preferentially; (2) many of the lagoons that were not visited were completely dry; (3) Grand Turk and South Caicos were not visited as these islands are so heavily developed that Whistling-ducks are highly unlikely to persist.

If Whistling-ducks arrive at lagoons for feeding well after dusk, and leave well before dawn, as occurs at some sites (P.

Bradley verbally), they would have been missed in the current survey. There is a suggestion that at sites where hunting pressure is high, birds are more wary, and delay flight until full darkness, leaving again well before dawn. For example at Long Island in the Bahamas, birds tend to fly to feeding sites at around dawn and dusk (Staus 1998a, 1998b), whereas in Jamaica flights tend to occur in full darkness (Williams & Rees 1997). Hunting pressure on West Indian Whistling-ducks in the Turks and Caicos is low to non-existent (pers. obs.), such that the birds are unlikely to be particularly wary; furthermore East and West Caicos are uninhabited.

Only a small proportion of the potential roosting habitat in coastal mangroves and scrub was covered. Hence most birds in these areas would have been missed. However, most of the better-developed mangrove vegetation occurred round lagoons rather than on the coast, and hence one might predict that lagoon-feeding birds would roost at the lagoons too. The possibility that large numbers of birds used the scrub for roosting, as they do in the Bahamas (Staus 1998a), cannot be dismissed, given the many thousands of hectares of this impenetrable habitat on the islands. The potential feeding areas on the saltflats did not appear suitable. They held an extraordinarily low density and diversity of birds during the study period, and there was apparently little primary productivity (no visible macrophytes or phytoplankton), and almost no visible invertebrate life.

Although breeding of West Indian Whistling-ducks on the islands has been proved relatively recently (Walsh-McGehee *et al.* 1998), there is no evidence to suggest that there has ever been a large population. The wide scatter of previous records hints at the bird having been

widespread at some time. Interviews with local people suggested that Whistling-ducks were a relatively common sight between approximately 60 and 20 years before present, and that they probably used agricultural crops and lagoons. Nowadays they are clearly not sufficiently abundant to be seen by local people in the course of their normal activities. However, agriculture and hunting have almost ceased on the Territory, and local people very rarely visit the extensive wetlands. Thus the lack of recent records may simply represent a reduction in the likelihood of people encountering Whistling-ducks.

The second suggestion - that birds were seasonally absent from the islands - is difficult to assess. During the study visit there was an unusually intense drought on the islands. Most of the lagoons were at least partially dry and lacking in macrophytes, phytoplankton and invertebrates, while the saltflats were mainly dry and unproductive. A rapid flush of growth following rain might perhaps make both habitats much more suitable.

Is it possible that West Indian Whistling-ducks are somewhat nomadic, and move between island sites in response to local variations in rainfall? The species is generally thought to be relatively sedentary (del Hoyo *et al.* 1992), and vagrancy, which might be an indicator of a tendency to nomadism, has very rarely been reported (Collar *et al.* 1992). However, an ability to move rapidly and exploit locally favourable conditions would appear to be adaptive in the Caribbean region where the climate is unpredictable. The bird's breeding season appears to be rather variable, indicating a flexible response to wetland conditions (Madge & Burn 1987). Thus the possibility that Turks and Caicos holds a significant population of West Indian Whistling-ducks at other

seasons or in other years cannot be excluded. Indeed, a confirmed breeding record was received from Conch Bar, Middle Caicos, following the onset of heavy rains in June 1999. Potential source populations are in Cuba, which lies ca.300km from the Caicos Islands and probably holds the largest West Indian Whistling-duck population, and in the southern Bahamas, 100-300km from the Caicos Islands, where there are also thought to be substantial populations (Collar *et al.* 1992).

Evaluation of survey methods

Because so few West Indian Whistling-ducks were recorded, it is rather difficult to evaluate the different survey methods. Hence this section is based largely on subjective impressions.

Dawn/dusk lagoon surveys appear to be a promising means of locating birds. Available evidence suggests that these tend to be the most favoured feeding sites (Staus 1998a), and our findings support this idea. Lagoons of the sort visited in Turks & Caicos are very simple to survey, because of their relatively small size and lack of emergent vegetation (Hilton *et al.* 2000). Saltflats are more problematic: their enormous extent means that a large effort is needed to cover a significant proportion of the total area at dawn or dusk.

Aerial surveys are probably not suitable for detection of West Indian Whistling-ducks due to the difficulty of identifying birds that aren't on open water. Aerial surveys must also be done in good light, when Whistling-ducks will usually be roosting and very difficult to detect.

In areas where there are large areas of xerophytic scrub - such as the Bahamas and Turks & Caicos - which serve as potential roosting habitat (Staus 1998a), it is unlikely that scrub transects will be a

viable census technique, since they are too labour intensive. In Turks & Caicos the mangrove area is much less substantial, and significant proportions of the habitat could be covered either in canoes or on foot with relatively low effort in a search for roosting birds. Similarly the use of flight line counts at dusk or dawn allows good coverage to be achieved with relatively low effort. However, there is no certainty that the birds do fly between mangroves and lagoons.

We have shown that West Indian Whistling-ducks respond to tape playback of their calls, and this could be a valuable tool in future survey work. We have not, however, quantified the probability of getting a response to playback from a bird that is present, nor investigated seasonal variation in response.

In this study, interviews with local people proved to be of little use in elucidating the current distribution of the species. However, this may not always be the case. In Turks & Caicos very few people work on the land or visit wetlands. Because we were unable to locate birds ourselves, it was difficult to corroborate anecdotal reports. In areas where local people are more likely to come into contact with the species, interviews should be seen as a potentially valuable tool for locating key sites. Interviews were used with apparent success to locate surviving populations of West Indian Whistling-ducks in Jamaica (Williams & Rees 1997). The similarity of the crepuscular and similar sized White-cheeked Pintail to Whistling-ducks at a distance and in very low light levels was striking, despite the very obvious differences between the species. Pintails tend to fly into lagoons in small parties at dusk, and on landing assume an alert posture with neck outstretched, making them appear very

long-necked. Reports of large, crepuscular ducks should therefore be treated with caution when made by inexperienced observers, such as the interviewees questioned in this study.

In conclusion, the initial search for the location of birds should mainly be focused on dawn and dusk lagoon visits. In addition it would be valuable to use dawn/dusk or night-time visits to maize crops, and also to try night visits to lagoons, with use of call playback, in order to examine the possibility that the birds do not move on to feeding areas until well after full darkness.

The extensive wetlands on West, North, Middle and East Caicos remain largely unaltered and undisturbed by humans. Hunting is at a very low ebb, and was much more widespread in the past. The only notable change to West Indian Whistling-duck habitat has been the decline of agriculture in the territory, which may have deprived the species of a food source. The habitat on the islands is very similar to that described by Staus (1998a, 1998b) in the Bahamas, where there is a relatively large population. It is therefore surprising that so few birds were recorded in the present survey. It remains possible that Turks and Caicos is an important range state, and further surveys at different times of the year are needed to clarify the situation.

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